

*Application/Control No. 09/673,135**Attorney Docket No. 077680-0114***REMARKS**

This is in full and timely response to the above-identified Office Action. Reexamination and reconsideration in light of the proposed amendments and the following remarks are respectfully requested.

Examiner Charles is courteously thanked for conducting a telephonic interview with the clients representative on December 11, 2002.

**Rejections Under 35 USC § 112**

In this response, claims 3, 11, 20-22, 25 and 41 have been amended to improve form and to overcome the rejections under 35 USC § 112, second paragraph.

**Rejections Under 35 USC § 102**

The rejection of claims 1-3, 6-11, 14-15, 21, 24-25, 36, 38 and 42 under 35 USC § 102(b) as being anticipated by Jones, is, to the degree that it still pertains to the claims as amended, respectfully traversed.

In this response, claim 1 is amended to call for the reinforcing ring to be so dimensioned and arranged as to distribute the rope load essentially uniformly over the inner ring. Support for this amendment is found in the paragraph spanning page 4, lines 18-27 of the originally filed specification (see page 3, lines 17-22 of the substitute specification).

The advantage derived by using the above type of reinforcing ring, is disclosed on page 3, last paragraph, to page 4, second paragraph, of the originally filed English language specification. With this type of arrangement, it is possible to obtain a pulley that is wear resistant on the one hand and soft and flexible on the other.

In general, an elastomeric layer which shows a substantial resiliency is subject to an enormous amount of wear at the surface where the rope or cable

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contacts the elastomeric layer. If on the one hand, the elastomeric layer is made harder and less resilient to improve wear characteristics, the resiliency decreases substantially. As a consequence, large shocks occur each time a clamping socket runs over the circumference of the pulley.

The invention is therefore directed to solving at least this problem. In connection with this invention, it is proposed to use a tire comprising an inner and outer ring and a reinforcing ring which is interposed between the inner and outer rings. This reinforcing ring is designed to distribute the radial forces exerted by the rope or cable upon encountering a clamping socket, more evenly over the inner ring which is a soft and resilient material. This even distribution of the force over the inner ring reduces the amount of heat that is produced by the flexing caused by the radially acting forces generated as the pulley rotates.

The reference to Jones discloses a tire for a rope pulley having a reinforcing ring 15 embedded therein. The reinforcing ring is disclosed at column 3, lines 35-40. More specifically, it is set forth that:

The annular reinforcing rings 15 serves in preventing tangential extrusion of the tire an application of the radial inward force which would otherwise result in deformation and stretching of the tire and subsequent disengaging of the tire from the hub and rim halves.

Therefore, there is no disclosure of the reinforcing ring being adapted to be dimensioned to distribute rope load essentially uniformly over the inner ring.

More specifically, the reinforcing ring of Jones prevents local stretching of the ring such that the ring cannot slip on the hub. This prior art reinforcement ring arrangement is thin as compared to the main body of the tire 13, and thus merely acts as a bandage which provides laterally acting strength to maintain the radial clamping force to hold the tire on the hub. This ring is thin and therefore inevitably flexible and thus insufficient as to provide the claimed effect of

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distributing the rope load essentially uniformly over the inner ring. In fact, the relative thinness of the reinforcing ring 15 and the indication that it can be a fabric or a web would suggest that load distribution is neither intended nor possible.

Additionally, the edges of the reinforcing ring are very closely proximate the surface of the rim halves 11a and 11b and thus would not appear to be able to provide an even distribution of the radially acting forces with respect to the outer circumference of the pulley.

The rejection of independent claim 42 is traversed on the basis discussed with the Examiner. This claim calls for the reinforcing ring to be interposed between the outer ring and the inner ring, made of a material which is rigid relative to the radially inner and the radially outer rings and which has at least one portion which is at least as thick as the radially outer ring.

It is submitted that the embodiments of the reinforcing rings which are disclosed in Jones and that are interposed between the inner and outer rings, do not have a portion which is as thick as the outer ring.

This feature has not been addressed in the rejection and there is no indication of where this feature is disclosed in the Jones reference. As established in *Ex parte Levy*, 17 U.S.P.Q.2d 1461 (BPAI 1990) it is incumbent upon the Examiner to identify where in the reference each element may be found. It is therefore respectfully submitted a prima facie case of anticipation has not been established for at least this reason.

It is also submitted that, if the reinforcing ring has only a small radial extension and shows a thin or ribbon-like structure, the reinforcing ring will not be able to distribute the radial load exerted at a particular location along the circumference to locations which are remote therefrom. If the reinforcing ring has only a small radial thickness the local load will deform or deflect the reinforcing ring at the point where the load acts. The reinforcing ring will fail to

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distribute the radial load along the circumferential direction such that adjacent parts of the ring will also transfer parts of the radial load to the inner elastomeric ring. However, only if the load is also transferred to adjacent locations will there occur a distribution of the flexing work to other parts of the inner elastomeric ring to decrease the temperature which is caused by an intensive flexing work.

It is admitted that only a reinforcing ring having a substantive radial extension shows the stiffness to distribute the load.

To provide an idea what is meant by stiffness let it be assumed that the reinforcing ring of Jones is placed upright on a table. The ring having the form of an endless thin ribbon will lose its circular configuration if only a small force is exerted at a position of the circumference opposite to the point where the reinforcing ring stands on the table. This demonstrates that the reinforcing of Jones is unable to distribute any radial force to locations other than the site below the point where the radial force acts.

In contrast thereto, if the reinforcing ring of the invention, having a structure set forth in claim 42, for example, is placed in the same upright configuration on a table it will take a much larger force to collapse the ring.

The reinforcing ring of Jones may prevent the elastomeric rings from being stretched out in the circumferential direction but the ring will not distribute radial loads to a bigger area along the circumferential direction.

Moreover, there is no hint in any of the references which have been cited which would give the hypothetical person of ordinary skill an idea of how to increase the lifetime of the tire of a rope pulley and reduce the power dissipation of the elastomeric material by distributing the radial force to a larger area.

What happens when the rope is traveling over the rope pulley can be understood as a kind of massaging of the elastomeric material, which massaging

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runs along the circumferential direction. The bigger that area is, the smaller will be the relative flexing work relative to a volume element of the elastomeric ring.

None of the references deals with this problem and thus cannot be seen as influencing patentability of the claimed subject matter.

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Rejections Under 35 USC § 103

1) The rejection of claims 4-5 under 35 USC § 103(a) as being unpatentable over Jones in view of JP('42635) is respectfully traversed.

It is submitted that, in order for a prima facie case of obviousness to be established, the hypothetical person of ordinary skill must, while working with a total lack of any knowledge of the claimed subject matter and without any inventive activity, be able to arrive at the claimed subject matter given the teachings of the references applied.

In this instance, there are no such teachings available. Claims 4 and 5 respectively call for a) the width of the outer circumferential surface of the pulley body to correspond to the width of the radially inner and the radially outer rings; and b) for the radially inner and the radially outer rings to have approximately the same width.

However, the Jones arrangement is clearly tapered so as to have an essentially inverted frusto-conical configuration – note the outwardly flared sides of the rim halves 11a and 11b. The inner ring is clearly narrower than the outer ring, and the reinforcing ring, in the embodiments wherein inner and outer rings are utilized, is narrower than the outer ring and wider than the inner ring.

In order to motivate a change from this tapered configuration to the claimed subject matter, JP('42635) is cited to show a pulley having an outer ring 8, a radially inner ring 2 and a pulley body, wherein the body has a width which

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corresponds to the width of the inner and outer rings which are approximately the same width in order to balance the fluctuating and compressive loads on the pulley during operation.

The motivation to consider a transfer of teachings between Jones and JP('42635), is alleged to be that it would allegedly balance fluctuating and compressive loads during operation.

It cannot, however, be assumed without specific disclosure that Jones does not already provide this balancing feature or that the proposed modification might render the Jones arrangement partially inoperable for its intended purpose. The purported obvious combination hinges on the conjecture that the proposed change would enhance the operation of Jones. However, there is nothing in either of the references that would lead the hypothetical person of ordinary skill to understand this possibility or toward a modification of the nature suggested in this rejection.

"If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)."  
M.P.E.P. § 2143.01.

In addition, and more importantly, it must be questioned as to why the person of ordinary skill would bother to look to a torsional damper arrangement for alternators or the like of the nature disclosed in JP('42635) when considering the construction of a rope pulley such as used in rope or cable situations. It is submitted that the two fields of endeavor are quite dissimilar despite the fact that both utilize pulleys per se. Thus, it is submitted that the hypothetical person of ordinary skill would not look to JP('42635) for teachings with respect to a pulley of the nature disclosed in Jones.

It is also pointed out that JP('42635) discloses in paragraph [0017] a pulley body that has a hard hollow outer casing made of an aluminum alloy and

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an interior which is filled with a core including metal wires. The hard metallic outer casing should immediately be contrasted with the elastomeric material from which the body of the tire in Jones is formed.

2) The rejection of claim 12 under 35 USC § 103(a) as being unpatentable over Jones in view of Nakamura et al. '038 is respectfully traversed.

This rejection is based on the position that the hypothetical person of ordinary skill would be motivated to construct the reinforcing ring of Jones using a casting technique in light of the teachings which can be gleaned from Nakamura et al. '038. The motivation is alleged to be that it would be obvious to modify the reinforcing ring of Jones so that it is shaped by forging in order to minimize manufacturing costs and improve surface toughness.

It is respectfully submitted that this rejection is also based on conjecture. To make the reinforcing ring of Jones from a metal such as aluminum is seen as being fraught with stumbling blocks and would not be remotely considered. That is to say, there no surface wear/toughness problem can be either encountered or envisaged with a reinforcing ring that is buried deep under an elastomeric ring member and therefore no impetus to consider a transfer of teachings.

3) The rejection of claim 26 under 35 USC § 103(a) as being unpatentable over Jones in view of Colford ('176), is respectfully traversed.

This rejection is predicated on the unsupported position that there is a wear and tear problem associated with the inner ring of the Jones tire arrangement. It is submitted that, in its deep seated position the inner ring of the tire cannot be expected to be exposed to conditions that would prompt the person of ordinary skill to consider a transfer of teachings from Colford. The surface of the outer ring of the tire may be so exposed, but it cannot be agreed that the inner ring would, in any way, be considered exposed to abrasion to the degree that fiber reinforcement (for example) would be considered.

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The modification could be made. However, it is well established that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1420 (Fed. Cir. 1990). M.P.E.P. § 2143.01

4) The rejection of claims 27, 28 and 31 under 35 USC § 103(a) as being unpatentable over Jones in view of Lengenfelder, Jr. et al.('225), is respectfully traversed.

This rejection indicates that Jones does not disclose a clamping device associated with the tire and Lengenfelder, Jr. et al. is cited to overcome this shortcoming. However there is no motivation to make the allegedly obvious transfer of teachings. In fact, it would appear to be redundant.

Attention is called to the fact that Jones discloses a structure which provides an essentially similar clamping function - see column 3, lines 25-46 wherein it is stated that:

On assembling a pulley according to the embodiment the tire is snugly fitted over the outer circumference of the hub 12 and the rim halves 11a and 11b are mounted to the hub 12 by utilization of the fixing means 17 and are brought into clamping engagement with the hub. **As a result the tire is snugly clamped the tire therebetween the rim halves.** Because of the tapered complementary configuration of the side walls of the tire and the rim halves any radially inward force applied to the tire by a pulley rope serves to bring the tire into greater clamping engagement with the rim halves 11a and 11b. The annular reinforcing rings 15 serves in preventing tangential extrusion of the tire an application of the radial inward force which would otherwise result in deformation and stretching of the tire and subsequent disengaging of the tire from the hub and rim halves. The inner



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layer 16 of elastomeric material defines a locking ring which serves in insulating the pulley rim halves and the hub from any vibration created by engagement of the tire with a pulley rope and serves in ensuring a strong frictional engagement between the outer circumference of the hub 12 and the inner circumference of the tire 13. (emphasis added)

In light of this disclosure, it cannot be seen that any problem is disclosed that would lead the person of ordinary skill toward the transfer of teachings purported to flow from the combination of references applied in this rejection.

It is again stressed that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed Cir. 1992). M.P.E.P. § 2143.01

It is respectfully submitted that the Examiner has failed to establish a *prima facie* case of obviousness in this and all of the preceding rejections under § 103.

5) The rejection of claims 39-42 under 35 USC § 103(a) as being unpatentable over Jones, is respectfully traversed.

In this rejection, it is suggested that the hypothetical person of ordinary skill would be moved to consider the use of reinforcing fiber in the reinforcing ring. However, Jones discloses at column 3 lines 14-19, that:

The tire accommodates a reinforcing ring 15 which is located adjacent the inner circumference of the tire and may be formed of any suitable reinforcing material such

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as metal, a fabric web, a metal mesh or alternatively of  
an elastomeric material similar to that of the main body  
of the tire but of a greater strength or hardness.  
(emphasis added)

It is not seen that any further reinforcement would be deemed necessary,  
especially in light of the fact that it is buried between the inner and outer ring  
members 13 and 16 .

6) The rejection of claims 40-41 and 43-44 under 35 USC § 103(a) as being  
unpatentable over Jones in view of EP(194948) is respectfully traversed.

This rejection is based on the incorrect understanding that the inner layer  
2 of EP(194948) is a reinforcing ring. It is not. It is disclosed as being a  
resilient elastic material while the outer layer is disclosed as being more abrasive  
resistant (see first full paragraph on page 5 of EP(194948)). This rejection is  
therefore based on an incorrect understanding of EP(194948) which does not  
have a reinforcing layer per se and would, due to this absence, tend to teach  
away from the use of a reinforcement layer per se. The sturdy rectangular-  
shaped channel in which the layers 1 and 2 are disposed would have to be seen  
as providing all of the necessary support that is required in this arrangement and  
therefore would not provide the hypothetical person of ordinary skill with any  
indication that a modification of a reinforcing layer (which is not used in this  
arrangement) might be applied to the Jones arrangement.

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Conclusion

It is submitted that the claims pending before the Patent Office are allowable over the art for at least the reasons advanced above. Accordingly, favorable reconsideration and allowance of this application is courteously solicited.

Respectfully submitted,

Date: December 12, 2002

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Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge Deposit Account No. 19-0741 for any such fees; and applicant(s) hereby petition for any needed extension of time.

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MARKED-UP VERSIONS OF AMENDED CLAIMS

1. (Twice amended) A pulley comprising:  
a pulley body which has a rotationally symmetrical outer circumferential surface and  
a pulley hub, and having a tire which sits on the outer circumferential surface and has at least one radially outer and one radially inner ring and also a reinforcing ring, the reinforcing ring being made of a material which is rigid relative to the radially inner and the radially outer rings, and which is so dimensioned and arranged as to [distributes the] distribute rope load [essentially] substantially uniformly over the inner ring, the reinforcing ring having a diameter which is smaller than the outside diameter of the radially outer ring, the radially inner ring being made of an elastomer, the radially outer ring being made of an elastomer or a plastic, and the radially outer ring having a greater Shore hardness than the radially inner ring.
3. (Twice amended) The pulley as claimed in claim 2, wherein [at least one of the lateral flanks is flat or frustoconical, and in that] a flange disk, which projects radially outward beyond the outer circumferential surface of the pulley body, is detachably fastened to [at least one] each of the lateral flanks.
11. (Twice amended) The pulley as claimed in claim 1, wherein the reinforcing ring is a sheet-metal formed part.
20. (Twice amended) The pulley as claimed in claim 1, wherein the reinforcing ring contains slots which run in the circumferential direction and lead from the lateral flank[s] into the reinforcing ring.
21. (Twice amended) The pulley as claimed in claim 1, wherein at least [either] one of the radially outer or the radially inner ring is connected to the reinforcing ring in a positive-locking manner.

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22. (Twice amended) The pulley as claimed in claim 1, wherein the radially inner ring is recessed at its lateral flanks at least in sections relative to the surfaces defined by the lateral flank[s] of the pulley body.

25. (Twice amended) The pulley as claimed in claim [2] <sup>3</sup>, wherein [the] a distance between [the] <sup>each</sup> each lateral flank[s] of the radially outer ring is equal to [the] a clearance distance between [the] each flange disk at this location.

41. (Once amended) A pulley as claimed in claim 1, wherein the reinforcing ring has an indented cross-sectional [profile] shape.